# Rotary Shafts – D Tolerance h9 (Cold-Drawn) / h7 & g6 (Ground)

## Straight

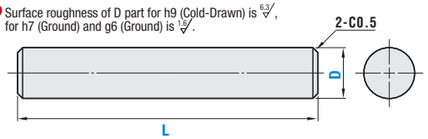
Select from h9 (Cold-drawn), h7 (Ground) and g6 (Ground) for your applications.

**Rotary Shafts – Straight**

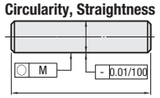
RoHS10

| | Type | D Tolerance | Material | Surface Treatment |
|---|---|---|---|---|
| (1) | NSFMR | h9 (Cold-Drawn) | 1045 Carbon Steel or Equivalent | — |
| | SFMR | | | Black Oxide |
| | PSFMR | | | Electroless Nickel Plating |
| | SSFMR | | 304 Stainless Steel | — |
| (2) | NSFHR | h7 (Ground) | 1045 Carbon Steel or Equivalent | — |
| | SFHR | | | Black Oxide |
| | PSFHR | | | Electroless Nickel Plating |
| | SSFHR | | 304 Stainless Steel | — |
| (3) | NSFR | g6 (Ground) | 1045 Carbon Steel or Equivalent | — |
| | SFR | | | Black Oxide |
| | PSFR | | | Electroless Nickel Plating |
| | SSFR | | 304 Stainless Steel | — |
| | HFR | | 4137 Alloy Steel or Equivalent Hardness 30~35 HRC min. | Black Oxide |
| | PHFR | | | Electroless Nickel Plating |

Surface roughness of D part for h9 (Cold-Drawn) is 6.3, for h7 (Ground) and g6 (Ground) is 1.6.




**Circularity, Straightness**




Straightness of size D2, D2.5 is 0.1/100.

Not applicable to h9 (Cold-Drawn).

**Circularity of Part D**

| D Over | D or Less | Circularity M |
|---|---|---|
| 1 | 2.5 | 0.006 |
| 3 | 13 | 0.004 |
| 13 | 20 | 0.005 |
| 20 | 40 | 0.006 |
| 40 | 50 | 0.007 |

Not applicable to h9 (Cold-Drawn).

**L Dimension Tolerance**

| Dimension Over | Dimension To | Dimension Tolerance |
|---|---|---|
| 14 | 30 | ±0.2 |
| 30 | 120 | ±0.3 |
| 120 | 400 | ±0.5 |
| 400 | 800 | ±0.8 |

**(1) h9 (Cold-Drawn)**

| Type | Part Number $D_{h9}$ | | L 0.1 mm Increment |
|---|---|---|---|
| NSFMR, SFMR, PSFMR, SSFMR | 3 | 0 -0.025 | 15.0–150.0 |
| | 4 | 0 -0.030 | 15.0–200.0 |
| | 5 | | 15.0–250.0 |
| | 6 | | 15.0–500.0 |
| | 8 | 0 -0.036 | 15.0–500.0 |
| | 10 | | 15.0–800.0 |
| | 12 | 0 -0.043 | 15.0–900.0 |
| | 15 | | 15.0–1000.0 |
| | 20 | 0 -0.052 | 20.0–1000.0 |
| | 25 | | 20.0–1000.0 |
| | 30 | | 20.0–1000.0 |
| | 35 | 0 -0.062 | 70.0–1000.0 |
| | 40 | | 80.0–1000.0 |
| | 50 | | 100.0–1000.0 |

*D6 is not available for SSFMR

**(2) h7 (Ground)**

| Type | Part Number $D_{h7}$ | | L 0.1 mm Increment |
|---|---|---|---|
| NSFHR, SFHR, PSFHR, SSFHR | 3 | 0 -0.010 | 15.0–150.0 |
| | 4 | 0 -0.012 | 15.0–200.0 |
| | 5 | | 15.0–250.0 |
| | 6 | | 15.0–500.0 |
| | 8 | 0 -0.015 | 15.0–500.0 |
| | 10 | | 15.0–800.0 |
| | 12 | 0 -0.018 | 15.0–900.0 |
| | 15 | | 15.0–1000.0 |
| | 17 | | 20.0–1000.0 |
| | 20 | 0 -0.021 | 20.0–1000.0 |
| | 25 | | 20.0–1000.0 |
| | 30 | | 20.0–1000.0 |
| | 35 | 0 -0.025 | 70.0–1000.0 |
| | 40 | | 80.0–1000.0 |
| | 50 | | 100.0–1000.0 |

**(3) g6 (Ground)**

| Type | Part Number $D_{g6}$ | | L 0.1 mm Increment |
|---|---|---|---|
| NSFR, SFR, PSFR, SSFR | 2 | -0.002 -0.008 | 15.0–50.0 |
| | 2.5 | | 15.0–50.0 |
| | 3 | | 15.0–150.0 |
| | 4 | -0.004 -0.012 | 15.0–200.0 |
| | 5 | | 15.0–250.0 |
| | 6 | | 15.0–500.0 |
| | 8 | -0.005 -0.014 | 15.0–500.0 |
| | 10 | | 15.0–800.0 |
| | 12 | -0.006 -0.017 | 15.0–900.0 |
| | *13 | | 15.0–900.0 |
| | **15 | | 15.0–1000.0 |
| | *16 | | 15.0–1000.0 |
| | 17 | | 20.0–1000.0 |
| | *18 | | 20.0–1000.0 |
| | **20 | -0.007 -0.020 | 20.0–1000.0 |
| | *22 | | 20.0–1000.0 |
| | **25 | | 20.0–1000.0 |
| | **30 | | 20.0–1000.0 |
| | **35 | -0.009 -0.025 | 70.0–1000.0 |
| | **40 | | 80.0–1000.0 |
| | **50 | | 100.0–1000.0 |

NSFR, SFR, PSFR, SSFR: D13, 16, 18 and 22 are not available for SSFR.

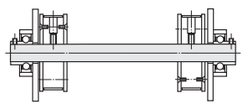
* HFR: Only * marked sizes are available.

* PHFR: Only * marked sizes are available.

**Part Number Example**

| Part Number | - | L |
|---|---|---|
| SFMR15 | - | 150 |
| PSFHR20 | - | 300 |

**Application Example**





There's more on the web: misumiusa.com



# Rotary Shafts – D Tolerance h9 (Cold-Drawn) / h7 & g6 (Ground)

## Straight, *continued*

### Available Types

**(1) h9 (Cold-Drawn)**

| Type | NSFMR, SFMR, PSFMR | | | | | | | | | SSFMR | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | Min. L 50.0 | L50.1 100.0 | L100.1 150.0 | L150.1 200.0 | L200.1 300.0 | L300.1 400.0 | L400.1 600.0 | L600.1 800.0 | L800.1 Max. | Min. L 50.0 | L50.1 100.0 | L100.1 150.0 | L150.1 200.0 | L200.1 300.0 | L300.1 400.0 | L400.1 600.0 | L600.1 800.0 | L800.1 Max. |
| 3 | • | • | • | — | — | — | — | — | — | • | • | • | — | — | — | — | — | — |
| 4 | • | • | • | • | — | — | — | — | — | • | • | • | • | — | — | — | — | — |
| 5 | • | • | • | • | • | — | — | — | — | • | • | • | • | • | — | — | — | — |
| 6 | • | • | • | • | • | • | •(Max.500) | — | — | — | — | — | — | — | — | — | — | — |
| 8 | • | • | • | • | • | • | • | — | — | • | • | • | • | • | • | • | — | — |
| 10 | • | • | • | • | • | • | • | • | — | • | • | • | • | • | • | • | • | — |
| 12 | • | • | • | • | • | • | • | • | •(Max.900) | • | • | • | • | • | • | • | • | •(Max.900) |
| 15 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 20 | •(Min.20) | • | • | • | • | • | • | • | • | •(Min.20) | • | • | • | • | • | • | • | • |
| 25 | •(Min.20) | • | • | • | • | • | • | • | • | •(Min.20) | • | • | • | • | • | • | • | • |
| 30 | •(Min.20) | • | • | • | • | • | • | • | • | •(Min.20) | • | • | • | • | • | • | • | • |
| 35 | — | • | • | • | • | • | • | • | • | — | • | • | • | • | • | • | • | • |
| 40 | — | • | • | • | • | • | • | • | • | — | • | • | • | • | • | • | • | • |
| 50 | — | • | • | • | • | • | • | • | • | — | • | • | • | • | • | • | • | • |

**(2) h7 (Ground) (3) g6 (Ground)**

| Type | NSFHR, SFHR, SFR, PSFHR, PSFR | | | | | | | | | SSFHR, SSFR | | | | | | | | | HFR, PHFR | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | Min. L 50.0 | L50.1 100.0 | L100.1 150.0 | L150.1 200.0 | L200.1 300.0 | L300.1 400.0 | L400.1 600.0 | L600.1 800.0 | L800.1 Max. | Min. L 50.0 | L50.1 100.0 | L100.1 150.0 | L150.1 200.0 | L200.1 300.0 | L300.1 400.0 | L400.1 600.0 | L600.1 800.0 | L800.1 Max. | Min. L 50.0 | L50.1 100.0 | L100.1 150.0 | L150.1 200.0 | L200.1 300.0 | L300.1 400.0 | L400.1 600.0 | L600.1 Max. |
| 2 | • | — | — | — | — | — | — | — | — | • | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2.5 | • | — | — | — | — | — | — | — | — | • | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 3 | • | • | • | — | — | — | — | — | — | • | • | • | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 4 | • | • | • | • | — | — | — | — | — | • | • | • | • | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 5 | • | • | • | • | • | — | — | — | — | • | • | • | • | • | — | — | — | — | — | — | — | — | — | — | — | — |
| 6 | • | • | • | • | • | • | •(Max.500) | — | — | • | • | • | • | • | • | •(Max.500) | — | — | — | — | — | — | — | — | — | — |
| 8 | • | • | • | • | • | • | • | — | — | • | • | • | • | • | • | • | — | — | — | — | — | — | — | — | — | — |
| 10 | • | • | • | • | • | • | • | • | — | • | • | • | • | • | • | • | • | — | — | — | — | — | — | — | — | — |
| 12 | • | • | • | • | • | • | • | • | •(Max.900) | • | • | • | • | • | • | • | • | •(Max.900) | — | — | — | — | — | — | — | — |
| 13 | • | • | • | • | • | • | • | • | •(Max.900) | — | — | — | — | — | — | — | • | •(Max.900) | — | — | — | — | — | — | — | — |
| 15 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 16 | • | • | • | • | • | • | • | • | • | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 17 | •(Min.20) | • | • | • | • | • | • | • | • | •(Min.20) | • | • | • | • | • | • | • | • | — | — | — | — | — | — | — | — |
| 18 | •(Min.20) | • | • | • | • | • | • | • | • | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 20 | •(Min.20) | • | • | • | • | • | • | • | • | •(Min.20) | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 22 | •(Min.20) | • | • | • | • | • | • | • | • | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 25 | •(Min.20) | • | • | • | • | • | • | • | • | •(Min.20) | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 30 | •(Min.20) | • | • | • | • | • | • | • | • | •(Min.20) | • | • | • | • | • | • | • | • | — | • | • | • | • | • | • | • |
| 35 | — | • | • | • | • | • | • | • | • | — | • | • | • | • | • | • | • | • | — | • | • | • | • | • | • | • |
| 40 | — | • | • | • | • | • | • | • | • | — | • | • | • | • | • | • | • | • | — | • | • | • | • | • | • | • |
| 50 | — | • | • | • | • | • | • | • | • | — | • | • | • | • | • | • | • | • | — | • | • | • | • | • | • | • |

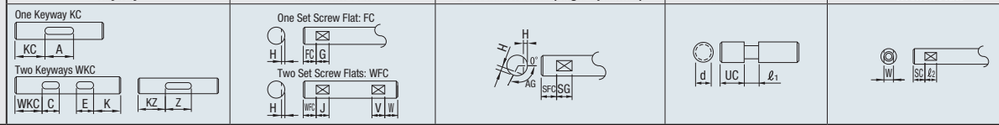
**Part Number Alterations**

| Part Number | - | L | - | (KC, WKC, FC...etc.) |
|---|---|---|---|---|
| PSFMR30 | - | 250 | - | KC20-A10 |

For Keyway Details, **P.853**.

Select from h9 (Cold-Drawn), h7 (Ground) and g6 (Ground) for your applications.

**Alterations**




| | Keyway | Set Screw Flat | 2 Set Screw Flats (Angle Specified) | Slit Cam Groove | Wrench Flats |
|---|---|---|---|---|---|
| Code | KC / WKC / KZ | FC / WFC | SFC | UC | SC |
| Spec. | KC: Adds a keyway.<br>**Ordering Code:** KC50-A10<br>WKC: Adds two keyways.<br>**Ordering Code:** WKC50-C8-K40-E10<br>**Ordering Code:** KZ100-Z10<br>KC, A, WKC, C, E, K, KZ, Z = 0.1 mm Increment<br>A, C, E, Z≤100<br>For keyway details, **P.853**.<br>If 3 keyways are required use both KC and WKC. If 4th keyway is required use KZ only as addition to KC and WKC.<br>Not applicable to D=2~5<br>When keyway position is less than 1 mm away from the end face, R is not applied. Ex. | FC: Adds 1 set screw flat.<br>**Ordering Code:** FC10-G3<br>WFC: Adds 2 set screw flats.<br>**Ordering Code:** WFC10-J3-W10-V3<br>FC, G, WFC, J, W, V=1 mm Inc.<br>G, J, V≤50<br>D / H: 3–5 / 0.5; 6–17 / 1; 18–40 / 2; 50 / 3<br>Not applicable to D2 and D2.5. | Adds a set screw flat at any designated angle besides the datum plane (0°).<br>SFC, SG= 1 mm Increment<br>AG = 15° Increment<br>SG≤50<br>**Ordering Code:** SFC10-SG3-AG120<br>D / H: 3–5 / 0.5; 6–17 / 1; 18–40 / 2; 50 / 3<br>Not applicable to D2 and D2.5.<br>When combined with other alterations, ±2 degree phase differential may occur. | Adds a slit cam groove.<br>UC=1mm Increment<br>**Ordering Code:** UC10<br>UC+ℓ1≤L<br>UC≥1<br>Not applicable to D2 and D2.5.<br>Not applicable to D13 or more.<br>D / d / ℓ2: 3 / 2; 4 / 3; 5 / 4; 6 / 5; 8 / 7 (ℓ2 = 4); 10 / 8; 12 / 10 (ℓ2 = 5) | Adds a wrench flat.<br>SC = 1 mm Increment<br>SC+ℓ2≤L<br>SC=0 or SC≥1<br>A wrench flat is added to the opposite surface of keyway alteration.<br>D / W / ℓ2: 6 / 5 / 8; 8 / 7 / 8; 10 / 8 / 8; 12–13 / 10 / 10; 15–16 / 13 / 10; 17–18 / 14 / 10; 20, 22 / 17 / 10<br>D / W / ℓ2: 25 / 22 / 10; 30 / 27 / 15; 35 / 30 / 15; 40 / 36 / 20; 50 / 41 / 20<br>When combined with other alterations, ±2 degree phase differential may occur. |

Keyways and set screw flats are added in the same plane. When the distance of the alterations are over 500 mm, ±2 degree phase differential may occur.

**Alterations**

| | L Dimension Tolerance | 2 Set Screw Flats at Both Ends | Set Screw Flat Depth | Retaining Ring Groove | C Chamfer Change on D |
|---|---|---|---|---|---|
| Code | LKC | KWC | WC | TA, TB | CD |
| Spec. | Changes L Dimension Tolerance.<br>**Ordering Code:** LKC<br>L<500C L±0.05<br>L≥500C L±0.1 | Adds 2 Set Screw Flats at both ends.<br>KWC = 1 mm Increment<br>**Ordering Code:** KWC20<br>KWC≤B-m, S-m<br>L≤680 is applicable<br>Not applicable to D dimensions other than indicated above.<br>D / W: 8 / 7; 10 / 8; 12 / 9; 15 / 12; 20 / 16; 25 / 20; 30 / 25; 35 / 30; 40 / 35; 50 / 45 | Set Screw Flat Depth can be specified in 0.1 mm increments.<br>**Ordering Code:** WC6.8<br>D8 or more is applicable.<br>Applicable only when KWC alteration is performed. | Adds a retaining ring groove. (Applicable retaining rings are included.)<br>TA, TB = 1 mm Increment<br>**Ordering Code:** TA10-TB10<br>2≤TA, TB<=150<br>For dimensions of the retaining ring groove, please refer to **P.853**. | CD= Selection from Table below.<br>**Ordering Code:** CD2<br>Chamfer (CD) / Applicable Dia.: C2 / ø6 –ø51; C3 / ø8 –ø51; C4 / ø10 –ø51; C5 / ø12 –ø51 |